

Dual Independent Footwear and Wrist Strap Tester Installation and Operating Instructions



Figure 1. Vermason 222700 Dual Independent Footwear and Wrist Strap Tester

Description

The Vermason Dual Independent Footwear and Wrist Strap Tester is designed to test personal grounding devices, wrist strap and ESD footwear, to satisfy the requirements and the recommendations of EN 61340-5-1.

Use the Vermason Dual Independent Footwear and Wrist Strap Tester to fulfill the requirements of EN 61340-5-1. Per EN61340-5-1 Table 1 ESD protective item requirements, the Resistance to be for Wrist Strap as worn to be $1M = 1 \times 10^6$ ohms $\leq R_p \leq 3.5 \times 10^7$ ohms.

“When footwear/floor systems are used as primary means of grounding personnel, the resistance of the combination shall be determined by the ESD co-ordinator, and is recommended to be $1M = 1 \times 10^6$ ohms and 3.5×10^7 ohms” (EN 61340-5-1 Table 1 ESD protective item requirements NOTE 2).

“Wrist straps shall be checked before use. Each check shall be made with the wrist band worn in contact with the wearer’s skin and with the ground cord attached to the appropriate tester.” (EN 61340-5-1 clause 9.6

Daily checks, clause 9.6.2 Wrist strap)
“Where toe and heel straps are used as ESD footwear, once these are worn outside the EPA (ESD protected area, particularly on carpets, they are likely to accumulate fluff and become ineffective; this requires that they be checked or replaced on every visit to the EPA. ...When ESD footwear is used, it should be noted that ESD footwear alone cannot achieve protection, but needs to be used in conjunction with a suitable ESD floor.” (EN 61340-5-2 clause 5.2.8 Footwear)

“All wearers shall check that their heel and toe straps meet requirements. The check shall be made before entering the EPA.” (EN 61340-5-1 Daily checks, clause 9.6.3 Non-permanent footwear)

Packaging

- 1 Dual Independent Footwear and Wrist Strap Tester
- 1 Dual Foot Plate
- 1 Stereo Plug to Stereo Plug Cord
- 1 Banana Plug to Ring Terminal Cord
- 1 Certificate of Calibration

Installation

The resistance limits for footwear and wrist strap tests are controlled by the DIP switches located on the left-side of the tester (see Figure 2). See the following tables for the DIP switch settings and their corresponding test values.

Footwear Resistance

DIP switches 1 and 2 control the “HIGH” test limit.

Switch 1	Switch 2	HIGH Limit Resistance
ON	ON	10 Megohms (1×10^7)
OFF	OFF	35 Megohm (3.5×10^7)*
ON	OFF	100 Megohm (1×10^8)
OFF	ON	1 Gigohm (1×10^9)

* Default Setting

DIP switches 3 and 4 control the “LOW” test limit.

Switch 3	Switch 4	LOW Limit Resistance
ON	OFF	100 Kilohms (1×10^5)
OFF	ON	1 Megohm (1×10^6 ohms)*

* Default Setting

NOTE: At 1 Gigohm high limit resistance, a dirty foot plate could result in a false pass. Be sure to keep the foot plate clean when using this setting.

Wrist Strap Resistance

DIP switches 5 and 6 control the “HIGH” test limit.

Switch 5	Switch 6	HIGH Limit Resistance
OFF	OFF	Wrist Strap Test Disabled
ON	OFF	35 Megohm (3.5×10^7)*
ON	ON	10 Megohm (1×10^7)

* Default Europe Setting

DIP switch 5 must be ON (default setting) for the wrist strap test to be active. If the wrist strap test is disabled by DIP switch 5 being OFF, the 3 LEDs for this test will remain OFF at all times.

The “LOW” limit for the wrist strap test is set to 1 Megohms and cannot be changed by the user.

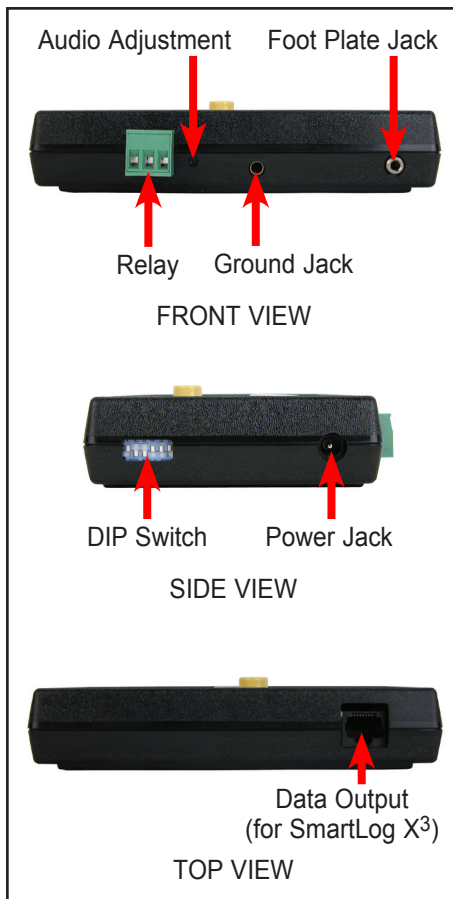


Figure 2. Dual Independent Footwear and Wrist Strap Tester side views

Installing The Tester And Foot Plate

Mount the tester at the desired location using the four mounting holes in the corners of the yellow mounting plate. Set the foot plate below the tester.

Insert one end of the Stereo Plug to Stereo Plug cord into the stereo jack located at the bottom of the tester (see Figure 2). Insert the other end of the cord into the stereo jack at the back of the foot plate.

Insert the banana plug end of the Banana Plug to Ring Terminal cord into the ground jack located at the bottom of the tester (see Figure 2). Connect the ring terminal end of the cord to earth ground. This connection will remove any static charge from the user before the test. NOTE: Failure to correctly ground the tester may result in damage not covered under warranty.

Insert the power supply plug into the power jack located on the left-side of the tester (see Figure 2). Plug the power supply into an appropriate power outlet.

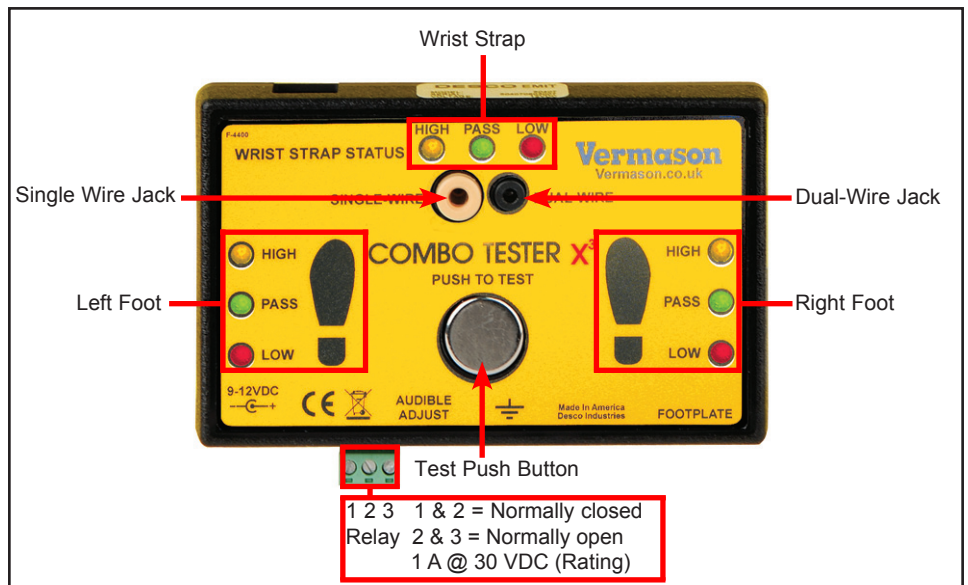


Figure 3. Dual Independent Footwear and Wrist Strap Tester features and components

Relay Terminal

A relay with both “normally open” and “normally closed” contacts is included for your convenience. Going from left to right, the terminal block on the bottom of the tester has terminals for “normally closed,” “common,” and “normally open” (see Figure 3). The relay can be used for opening an electric lock to an ESD sensitive area. The maximum contact rating is: 1A@30VDC.

Operation

Upon power up, the alarm will sound and all of the LEDs for the activated tests will be illuminated. The tester is now ready for use.

Pushing the touch plate on the front panel starts the test. During the test all LEDs will turn off to indicate that a test is in progress. The touch plate must remain depressed until the test results are displayed. Depending on the configuration of the tester, the test could require up to three (3) seconds.

The resistance is checked from the touch plate to the corresponding foot plate for each foot and from the touch plate to the wrist strap connector jacks through the operator. A wrist strap must be plugged into the appropriate jack before the touch plate is depressed if the wrist strap option is activated.

The Dual Independent Footwear and Wrist Strap Tester can test both single and dual wrist straps. Single-wire wrist straps are to be plugged into the banana jack labeled “SINGLE-WIRE” located on the front panel of the tester (see Figure 3). Dual-wire wrist straps are to be plugged into the phono jack labeled “DUAL-WIRE” located on the front panel of the tester (see Figure 3). The tester automatically determines what type of wrist strap is being tested.

The LED(s) will turn off while the test is in progress. The test results for each foot and wrist strap will then be displayed for approximately three (3) seconds. If all tests result in a “PASS” condition, the internal relay will activate.

If any of the test results fail “HIGH” or “LOW,” an audible alarm will sound. The LED(s) indicating the failed test will be displayed for approximately three (3) seconds, and the internal relay will not activate.

Specifications

Rated tester voltage:

12 VDC, 600 mA, (2.5 mm connector - center positive)

Relay contact rating:

1 A @ 30 VDC max

Temperature range:

41°F - 104°F (5°C - 40°C)

Operating conditions:

Indoor use only at altitudes less than 6500 ft. (2 km).

Maximum relative humidity of 80% up to 88°F (31°C) decreasing linearly to 50% @ 104°F (40°C).

Pollution degree:

2 per IEC 644

Calibration

The Vermason Dual Independent Footwear and Wrist Strap Tester is calibrated to standards traceable to NIST. Frequency of recalibration should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials.

In general, we recommend that calibration be performed annually.

The accuracy of the Dual Independent Footwear and Wrist Strap Tester is specified as:

- $\pm 5\%$ for 1 Megohm and lower resistance ranges
- $\pm 10\%$ for 1 Megohm and higher resistance ranges

A periodic check (once every 6 to 12 months) using a precision resistance box should be performed to verify proper operation.

The Vermason [222693](#) Limit Comparator is available for the convenient periodic testing of the Dual Independent Footwear and Wrist Strap Tester (see Figure 4).

The Vermason Limit Comparator allows the customer to perform NIST traceable calibration on a number of Vermason Testers including the [222690](#) and [222700](#). The Limit Comparator can be used on the shop floor within a few minutes virtually eliminating downtime, verifying that the Dual Independent Footwear and Wrist Strap Tester is operating within tolerances.

Using The [222693](#) Limit Comparator

Wrist Strap Operation Test

- I. Insert the Limit Comparator's test plug into the "DUAL-WIRE" phono jack located on the face of the Dual Independent Footwear and Wrist



Figure 4. Vermason [222693](#) Limit Comparator

Strap Tester.

- II. Select "1M LOW" with the Limit Comparator's rotary switch.
- III. Press and hold the touch plate of the tester until the test is completed. The tester should indicate a wrist strap FAIL LOW condition.
- IV. Select "1M PASS" on the Limit Comparator and repeat the test. The tester should indicate a wrist strap PASS condition.
- V. Select either the "10M PASS" or "35M PASS" setting, whichever one is appropriate, on the Limit Comparator and repeat the test. The tester should indicate a wrist strap PASS condition.
- VI. Select either the "10M HIGH" or "35M HIGH" setting, whichever one is appropriate, on the Limit Comparator and repeat the test. The tester should indicate a wrist strap FAIL HIGH condition.

Footwear Operation Test

- I. Insert the Limit Comparator's test plug into the phono jack located on the Dual Foot Plate.
- II. Select the appropriate FAIL LOW setting on the Limit Comparator.
- III. Press and hold the touch plate of the tester until the test is completed. The tester should indicate a FAIL LOW condition for both feet.
- IV. Select the appropriate PASS LOW setting on the Limit Comparator and repeat the test. The tester should indicate a PASS condition for both feet.
- V. Select the appropriate PASS HIGH setting on the Limit Comparator and repeat the test. The tester should indicate a PASS condition for both feet.
- VI. Select the appropriate FAIL HIGH setting on the Limit Comparator and repeat the test. The tester should indicate a FAIL HIGH condition for both feet.

Limited Warranty

Vermason expressly warrants that for a period of one (1) year from the date of purchase, Vermason Dual Independent Footwear and Wrist Strap Testers will be free of defects in material (parts) and workmanship (labour). Within the warranty period, a unit will be tested, repaired or replaced at Vermason's option, free of charge. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. Any unit under warranty should be shipped prepaid to the Vermason factory. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, Vermason will quote repair charges necessary to bring your unit to factory standards. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and proper shipping instructions and address.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will Vermason or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.